202201UECM3473OE4a

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Review of preview

Started on	Friday, 18 March 2022, 10:48 AM
Completed on	Friday, 18 March 2022, 10:48 AM
Time taken	20 secs
Grade	**0** out of a maximum of 10 (**0**%)

1

Marks: 1

- Suppose the losses $X_1, X_2, \ldots, X_n$ have $E(X_j) = 300$, $V(X_j) = 165$, and $Cor(X_i, X_j) = 0.63$ for $i \neq j$.
- You are given $X_1 = 210$, $X_2 = 240$, $X_3 = -130$.
- The credibility premium for the 5^{th} observation is 240 based on the first 4 observations.

Determine the credibility premium for the 6^{th} observation if $X_5 = 345$. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 258.792614
Marks for this submission: 0/1.

2

Marks: 1

You are given the following:
(i) Two risks have the following severity distribution.

	Probability of	Claim Amount
Amount of Claim	Risk 1	Risk 2
440	0.35	0.35
4790	0.43	0.35
17600	0.22	0.30

(ii) Risk 2 is three times as likely as Risk 1 of being observed.
(iii) A claim of 440 is observed, but the observed risk is unknown.
Determine the Buhlmann estimate of the expected value of a second claim amount from the same risk. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 6828.153974
Marks for this submission: 0/1.

3

Marks: 1

You are given the following:

- The conditional distribution $f_{X|\Theta}(x|\theta)$ is a member of the linear exponential family.
- The prior distribution $\pi(\theta)$ is a conjugate prior for $f_{X|\Theta}(x|\theta)$.
- $E(X) = 10.00$.
- $E(X_2|X_1 = 100) = 32.50$, where X_1 is the value of single observation.
- The expected value of the process variance is 150.00.

Determine the variance of the hypothetical means. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 50
Marks for this submission: 0/1.

4
Marks: 1

You are given:

- There are two groups of insureds, A and B. Each group is equally large.
- The number of claims for each member of either group follows a Poisson distribution.
- You are given the following information on mean number of claims for members of each group.

Group	Average Hypothetical Mean	Variance of Hypothetical Mean
A	0.2	0.01
B	0.4	0.09

Calculate the Buhlmann credibility to assign to one of a member. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.1667
Marks for this submission: 0/1.

5
Marks: 1

You sell individual health coverage. Aggregate claim costs vary for each insured, based on the insured's diet and exercise habits. The following table lists the mean and variance of annual aggregate claim costs per insured.

	Annual aggregate claim costs			
	Bad Diet		Good Diet	
Exercise Habit	Expected Claims	Claim Variance	Expected Claims	Claim Variance
Sedentary	10	25	6	12
Active	8	10	4	10
Total	9.0	18.5	5.0	12.0

60% of insureds have a bad diet and 40% have a good diet. Calculate the Buhlmann credibility factor for one year of experience. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.2452
Marks for this submission: 0/1.

6
Marks: 1

The number of claims per year on a policy follows a Poisson distribution with parameter Λ. Λ has a uniform distribution on [0,5]. An insured sunmits 6 claims in one year. Calculate the Buhlmann credibility estimate of the number of claims for the following year. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 4.090909
Marks for this submission: 0/1.

7
Marks: 1

You are given:

- An insured's loss size follows a single-parameter Pareto distribution with parameters $\alpha = 3$ and θ.
- The parameter θ varies by insured uniformly on [580,1100].
- An insured submits claims of 750, 1010, 1330

Using Buhlmann credibility methods, estimate the expected size of the next claims. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1209.895445
Marks for this submission: 0/1.

8
Marks: 1

You are given the following:

- The number of claims follow a distribution with mean λ and variance $e^{0.085\lambda}$.
- Claim sizes follow a distribution with mean θ and variance $e^{0.1\theta}$.
- the number of claims and claim sizes are independent.
- Λ and Θ have a prior probability distribution with joint density function

$$f(\lambda, \theta) = A\, \lambda^4\, \theta^4 e^{-(0.1\lambda+0.2\theta)},\ \lambda, \theta > 0$$

where A is a constant.
- During the first year we observed 2 claims and the claim amounts are 540, and 440.
- During the second year we observed 3 claims and the claim amounts are 340, 380 and 370.

Determine the Buhlmann estimate of the expected aggregate loss for the third year. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1223.73
Marks for this submission: 0/1.

9
Marks: 1

You are given:

- An insured's loss size follows a single-parameter Pareto distribution with parameters $\alpha = 5$ and θ.
- The parameter θ varies by insured uniformly on [540,900].
- An insured submits claims of 720, 940, 1140

Using Buhlmann credibility methods, estimate the expected size of the next claims. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 915.957447
Marks for this submission: 0/1.

10
Marks: 1

Let A_1 and A_2 be equally likely frequency distributions and let B_1 and B_2 be equally likely severity distributions.

Number of Claims	Probability of Claims		Amount of Claim	Probability of Claim Amount	
	A_1	A_2		B_1	B_2
0	0.66	0.50	180	0.45	0.83
1	0.34	0.50	320	0.55	0.17

A state A_i, B_j is selected at random, and a claim of 180 is observed.
Determine the Buhlmann credibility estimate for the next observation from the same selected state utilizing only aggregate claim amounts. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 99.401035
Marks for this submission: 0/1.